

## **Abstract**

**Aim:** To evaluate the push-out bond strength of two different fiber-reinforced composite post systems using two different luting cements- in vitro.

**Materials and Methods:** Eighty samples of extracted human upper central incisors were used for the study, which were randomly divided into four groups consisting of 20 samples each. In Group I, samples were luted using Variolink II, for Group II FRP posts were luted using Multilink N, in samples of Group III Clear posts were luted using Multilink N and Group IV consisted of samples in which FRP posts were luted using Variolink II. Clear posts which is made of glass fibers is radiopaque and is a translucent type of fiber post which enhances the polymerization reaction of resin cements used for cementation of the post to the dentin. FRP posts used were also translucent and radiopaque and their surface is extremely rough and retentive which enhances the adhesion of resin cement. Variolink II and Multilink N which were used, are dual cure resin cements. Variolink II uses a total-etch adhesive approach which requires a separate adhesive system involving acid etching of dentin followed by application of adhesive before cementation of post. This enhances the removal of thick smear layer from the surface of root dentin, thus enhancing the penetration of the resin cement to the dentin substrate. Multilink N is a self-etch adhesive which does not require a separate step of etching and application of adhesive prior to cementation. After preparation of the root samples, posts were luted inside the prepared canals using the different adhesive cements. After cementation, two millimeter thick sections of the samples were obtained and was tested using an universal testing machine with a push out pin of diameter 1 millimeter. The sections were placed over a custom made jig and were tested by application of force under a cross head speed of 1mm per minute from the apico coronal direction and the

value at which bond failure occurred was recorded. The values obtained were tabulated and the mean push out bond strength of all the four groups was calculated.

**Conclusion:** From the inferences, we can conclude that in Group I and Group III where Variolink II was used for cementation of posts to the root canals, showed higher mean bond strength values when compared to Group II and Group III in which Multilink N was used as adhesive. This discrepancy in mean values could be attributed to the difference in the adhesive approach among the luting cements used, which had an impact because of the removal of the smear layer from the radicular dentin. Considering the mode of bond failure, Type B ( adhesive failure between dentin and luting cement ) was found to be predominant followed by Type A( adhesive failure between post and luting cement). In few samples, Type E failure( Combination of adhesive failures) was observed. None of the samples showed cohesive failures (Type C, Type D). From this it could be concluded that the cementation procedure plays a role in bonding between post-cement-dentin interface.

**Clinical significance:** The success of endodontic treatment depends not only on elimination of pulpal / peri radicular pathology but also on post-endodontic management involving the maintenance of extensively damaged tooth in a functional state. In an attempt to prevent the occurrence of catastrophic events like vertical root fracture associated with metal posts, fiber-reinforced glass posts were introduced, which have an elastic modulus similar to that of dentin . In addition to this, improvements made in adhesive techniques further led to the popularity of these fiber posts.

**Key Words:** Glass fiber-posts, Resin cements, Push-out test.